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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, JENNIFER F

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,611	<b>Applicant(s)</b> SVENSSON ET AL.	
	<b>Examiner</b> JENNIFER F. CHANG	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/25/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-9 are presented for examination.

#### ***Specification***

2. The disclosure is objected to because of the following informalities: It appears that on page 8, line 3, the applicant intended to refer to Figure 8, but the disclosure refers to Figure 7. The context describes the Tx wave-guides present and parasitically excited, which is illustrated in Figure 8. Appropriate correction is required.

#### ***Drawings***

3. Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the active receive/transmit module (claim 8) and the suitable load (claim 9) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the

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renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

5. Claim 3 is objected to for the following informality: it is unclear whether "a respective transmitting and receiving frequency" in claim 3, line 3 refers to "a respective transmit and receive frequency" in claim 1, line 2 or if it refers to an additional frequency.

6. Claim 5 is objected to for the following informality: it is unclear whether "a respective transmitting and receiving frequency" in claim 5, lines 3-4 refers to "a respective transmit and receive frequency" in claim 1, line 2 or if it refers to an additional frequency.

7. Claim 7 is objected to for the following informality: "each one of the series-fed antenna column" (line 2) should read "each one of the series-fed antenna *columns*."

### ***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "transmitting and receiving array columns" is indefinite because it is unclear whether the applicant intends to claim separate columns of transmitting and receiving, or whether the array columns are able to both transmit and receive. It is also unclear whether

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"transmitting and receiving array columns" are array columns in addition to the "series-fed antenna array columns," or whether the limitation "transmitting and receiving array columns" is further describing the series-fed antenna array columns. Clarification is required.

Claim 1 is further rejected under 35 U.S.C. 112, second paragraph because it recites the limitations "each transmitting radiator element" and "each receiving radiator element". There is insufficient antecedent basis for these limitations in the claim.

10. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "a distance between each transmitting antenna array column and each receiving antenna array column is typically increased" is indefinite because it does not disclose from what standard the distance is being increased. Furthermore, the term "of an order of" in claim 2 is a relative term which renders the claim indefinite. The term "of an order of" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

11. Claim 4 recites the limitation "each slotted transmitting wave-guide" in line 2 and "each slotted receiving wave-guide" in line 3. There is insufficient antecedent basis for these limitations in the claim.

12. Claim 6 recites the limitation "the main radiation lobe" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

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13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1, 2, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Derneryd (cited by the applicant) in view of Proctor (US 2001/0031648 A1).

The applied reference by Derneryd has a common assignee with the instant application. Based upon the publication date of the reference (February 26, 2002), it constitutes prior art under 35 U.S.C. 102(b). This rejection under 35 U.S.C. 103(a) cannot be overcome by an affidavit under 37 CFR 1.130, 37 CFR 1.131 or 1.132.

As to claim 1, Derneryd teaches a sparse array antenna comprising series-fed antenna array columns tuned to a respective transmit and receive frequency, wherein

transmitting and receiving array columns (Fig. 9) are formed with a given distance ("element spacing," col. 2, line 41) between each transmitting radiator element and each receiving radiator element,

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the series-fed antenna columns being arranged in parallel to each other, thereby forming a symmetric interleaved transmit/receive array (Fig. 9).

Derneryd does not teach the receiving array columns operate as parasitic elements in a transmit mode and transmitting array columns operate as parasitic elements in a receive mode, thereby reducing creation of grating lobes. Proctor teaches an antenna comprising a plurality of elements, wherein less than all of the elements are active elements, i.e., for radiating or receiving a signal where the other elements serve as parasitic elements to reflect, redirect or absorb some portions of the emitted signal to advantageously shape the transmitted beam in the transmit mode and similarly advantageously affect the receive beam pattern. The elements can be operative in either the active or parasitic mode as determined by an element controller [0072]. Therefore, it would have been obvious to one of ordinary skill in the art that the inactive elements in the antenna array of Derneryd (i.e. the transmitting columns during a receive mode or the receiving columns during a transmit mode) can operate as parasitic elements as taught by Proctor, and one of ordinary skill in the art would have been motivated to utilize the teachings of Proctor to provide a means for using the non-active antenna elements to advantageously shape and affect transmit and receive beam patterns.

As to claim 2, Derneryd teaches a distance between each transmitting antenna array column and each receiving antenna array column is typically increased to be of an order of one wavelength to thereby obtain a sparse array (col. 2, line 40-47).

As to claim 6, Derneryd teaches the sparse array antenna is arranged to be scanable to also provide reduced sidelobes entering visual space when scanning the main radiation lobe from an off boresight direction (col. 1, line 57- col. 2, line 9).

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As to claim 8, Derneryd teaches the series-fed antenna array columns are connected to and fed from an active receive/transmit (T/R) module ("butler matrix," Fig. 9).

As to claim 9, Proctor teaches only one set of series-fed columns being actively used (508, Fig. 8) and another interleaved set of series-fed columns (500 or 502, Fig. 8) are terminated by a suitable load (504 and 506, Fig. 8) forming parasitic columns of the sparse array antenna.

16. Claims 1-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falk (US 2002/0003502) in view of Proctor (US 2001/0031648 A1).

The applied reference by Falk has a common assignee with the instant application. Based upon the publication date of the reference (January 10, 2002), it constitutes prior art under 35 U.S.C. 102(b). This rejection under 35 U.S.C. 103(a) cannot be overcome by an affidavit under 37 CFR 1.130, 37 CFR 1.131 or 1.132.

As to claim 1, Falk teaches a sparse array antenna comprising series-fed antenna array columns tuned to a respective transmit and receive frequency, wherein

transmitting and receiving array columns (10, 15, Fig. 1) are formed with a given distance between each transmitting radiator element and each receiving radiator element, the series-fed antenna columns being arranged in parallel to each other, thereby forming a symmetric interleaved transmit/receive array.

Falk does not teach the receiving array columns operate as parasitic elements in a transmit mode and transmitting array columns operate as parasitic elements in a receive mode, thereby reducing creation of grating lobes. Proctor teaches an antenna comprising a plurality of elements, where less than all of the elements are active elements, i.e., for radiating or receiving a signal where the other elements serve as parasitic elements to reflect, redirect or absorb some



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portions of the emitted signal to advantageously shape the transmitted beam in the transmit mode and similarly advantageously affect the receive beam pattern. The elements can be operative in either the active or parasitic mode as determined by an element controller [0072]. Therefore, it would have been obvious to one of ordinary skill in the art that the inactive elements in the antenna array of Falk (i.e., the transmitting columns during a receive mode or the receiving columns during a transmit mode) can operate as parasitic elements as taught by Proctor, and one of ordinary skill in the art would have been motivated to utilize the teachings of Proctor to provide a means for using the non-active antenna elements to advantageously shape and affect transmit and receive beam patterns.

As to claim 2, Falk teaches a distance between each transmitting antenna array column and each receiving antenna array column is typically increased to be of an order of one wavelength to thereby obtain a sparse array (the phrase "of an order of" renders the claim indefinite. Therefore, although Falk teaches the antenna elements spaced apart by wavelength/2 (col. 1, line 64), Falk reads on this claim because it is not clear what range is defined by "of an order of one wavelength").

As to claim 3, Falk teaches a series-fed antenna array formed as extended ridged slotted wave guides ("array of wave guides...comprising a symmetrically or un-symmetrically placed ridge," abstract) tuned to a respective transmitting and receiving frequency ("narrow-band tuned for a respective transmitting or receiving frequency," abstract).

As to claim 4, Falk teaches when having number  $n$  of slots in each slotted transmitting wave-guide the number of slots in each slotted receiving wave-guide being generally  $n + x$ , where  $x$  represents an integer digit ( $x = 0, 1, 2, 3, \dots$ ). Claim 4 is so broad that it fails to further

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limit claim 3 because any number of slots for the receiving and the transmitting wave guides would read on this claim.

As to claim 5, Falk teaches the series-fed array columns are formed as extended transmission lines (“wave guides,” abstract) containing radiation elements (“slots,” abstract), the array columns being tuned to a respective transmitting and receiving frequency (“narrow-band tuned for a respective transmitting or receiving frequency,” abstract).

As to claim 7, Falk teaches each one of the series-fed antenna column is narrowly tuned within a respective frequency band to thereby reduce coupling between the transmitting and receiving bands used (“narrow-band tuned for a respective transmitting or receiving frequency,” abstract).

As to claim 8, Falk teaches the series-fed antenna array columns are connected to and fed from an active receive/transmit (T/R) module (“feeding wave-guide,” col. 3, lines 6-10, 4, 6, Fig. 1).

As to claim 9, Proctor teaches only one set of series-fed columns being actively used (508, Fig. 8) and another interleaved set of series-fed columns (500 or 502, Fig. 8) are terminated by a suitable load (504 and 506, Fig. 8) forming parasitic columns of the sparse array antenna.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER F. CHANG whose telephone number is (571) 270-3831. The examiner can normally be reached on Monday-Friday 8:00am - 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JENNIFER F CHANG/  
Examiner, Art Unit 2821

/Douglas W Owens/  
Supervisory Patent Examiner, Art Unit 2821  
August 16, 2008